

ABSTRACT

A radio frequency (RF) communication system employs phase-modulated backscatter signals for RF communication from an RF tag to an interrogator. The interrogator transmits a continuous wave interrogation signal to the RF tag, which based on an information code stored in a memory, phase-modulates the interrogation signal to produce a backscatter response signal that is transmitted back to the interrogator. A phase modulator structure in the RF tag may include a switch coupled between an antenna and a quarter-wavelength stub; and a driver coupled between the memory and a control terminal of the switch. The driver is structured to produce a modulating signal corresponding to the information code, the modulating signal alternately opening and closing the switch to respectively decrease and increase the transmission path taken by the interrogation signal and thereby modulate the phase of the response signal. Alternatively, the phase modulator may include a diode coupled between the antenna and driver. The modulating signal from the driver modulates the capacitance of the diode, which modulates the phase of the response signal reflected by the diode and antenna.